

# **Proposal Reviews**

## **#216: Environmental and ecological assessment of the habitats in San Pablo Bay and Sacramento-San Joaquin Delta region using remote sensing techniques**

University of California, Davis, Department of Land, Air, and Water Resources

**Initial Selection Panel Review**

**Research and Restoration Technical Panel Review**

**Bay Regional Review**

**Delta Regional Review**

**External Scientific Review**    #1  
#2

**Environmental Compliance**

**Budget**

## Initial Selection Panel Review:

### CALFED Bay-Delta 2002 ERP PSP Initial Selection Panel Review

**Proposal Number:** 216

**Applicant Organization:** University of California, Davis, Department of Land, Air, and Water Resources

**Proposal Title:** Environmental and ecological assessment of the habitats in San Pablo Bay and Sacramento-San Joaquin Delta region using remote sensing techniques

Please provide an overall evaluation rating.

#### Explanation of Recommendation Categories: Fund

- **As Is** (a proposal recommended for funding as proposed)
- **In Part** (a proposal for which partial funding is recommended for selected project phases or components)
- **With Conditions** (a proposal for which funds are recommended if the applicant contractually agrees to meet the specified conditions)

**Consider as Directed Action in Annual Workplan** (a proposal addressing a high priority action that requires some revision followed by additional review prior to being recommended for funding)

**Not Recommended** (a proposal not currently recommended for funding-after revision may be considered in the future)

#### Note on "Amount":

For proposals recommended as Fund As Is, Fund In Part or Fund With Conditions, the dollar amount is the amount recommended by the Selection Panel.

For proposals recommended as Consider as Directed Action in Annual Workplan, the dollar amount is the amount requested by the applicant(s).

Fund	
As Is	-
In Part	-
With Conditions	-
Consider as Directed Action	-
Not Recommended	X

Amount:    **\$0**

Conditions, if any, of approval (if there are no conditions, please put "None"):

**None.**

Provide a brief explanation of your rating:

**The selection panel agreed with other reviewers that this proposal describes techniques that hold high promise for CALFED application, but does not adequately link the proposed effort to ongoing CALFED actions and programs. If the application were to be revised sometime in the future, the panel encourages the applicant to coordinate with other CALFEDfunded projects and other applicants who have or will propose to generate inventory data on species and habitats in an effort to articulate more specifically how the proposed tools will be employed.**

# Research and Restoration Technical Panel Review:

## CALFED Bay-Delta 2002 ERP PSP Research and Restoration Technical Panel Review Form

**Proposal Number:** 216

**Applicant Organization:** University of California, Davis, Department of Land, Air, and Water Resources

**Proposal Title:** Environmental and ecological assessment of the habitats in San Pablo Bay and Sacramento-San Joaquin Delta region using remote sensing techniques

**Review:**

**Please provide an overall evaluation summary rating:**

**Superior:** outstanding in all respects;

**Above Average:** Quality proposal, medium or high regional value, and no significant administrative concerns;

**Adequate:** No serious deficiencies, no significant regional impediments, and no significant administrative concerns;

**Not Recommended:** Serious deficiencies, significant regional impediments or significant administrative concerns.

Overall Evaluation Summary Rating	Provide a brief explanation of your summary rating
-Superior	<b>While the Panel wholeheartedly supports the concept of this proposal because of the huge potential of this technology to serve the broadest CALFED science community, it is not supportable because the approach is inadequately linked to ecological attributes and processes, does not take advantage of opportunities for active Bay-Delta research and is poorly related to restoration information needs or assessment. The Panel urges CALFED to view this proposal as the seed for a comprehensive service contract that will be developed and implemented in collaboration with the CALFED research community to integrate and provide interpretive data for many of the smaller-scale CALFED research projects.</b>
-Above average	
XAdequate	
-Not recommended	

1. **Goals and Justification.** Does the proposal present a clear statement of goals, objectives and hypotheses? Does the proposal present a clear justification and conceptual model for the project?

**This proposal represents the contrast between tremendous potential and poor justification and implementation. The applicants target a valuable goal to CALFED, a broad-scale environmental and ecological assessment of Bay-Delta habitats using remote sensing and GIS. In this respect it is extremely timely and a potentially powerful tool for cross-linking CALFED research. However, the phenomenal promise of this proposal is not followed through in their approach. For example, their hypothesis that different ecological conditions have different spectral characteristics is trivial because the generic relationships are well documented. The applicants assertion that they will assess the ecological conditions in the (various Delta) habitats and analyze their importance to the wildlife species in the region,**

their stated linkage between the results from the remote sensing data and ground measurements is highly questionable. Furthermore, the actual hypotheses imbedded in the proposed study should be that biomass quantity, net primary productivity, vegetation cover percentage, surface moisture, near-surface heat fluxes, water turbidity and sediment content, and water chlorophyll content are general conditions of the habitat condition for many wildlife species rather than a blanket assumption.

2. **Likelihood of Success (Approach, Feasibility, Capabilities and Performance Measures).** Is the project likely to succeed based on the approach, feasibility and project team capabilities? Are the proposed performance measures adequate for measuring the project's success?

As proposed the likelihood of success is questionable because the applicants do not appear to have linked to any of the broad-scale ecological questions and programs in the Bay-Delta that would provide both focus and groundtruthing data for precisely quantifying the relationships between spectral signatures and ecologically-important attributes.

3. **Outcomes and Products.** Will the project advance the state of scientific knowledge in general and/or make an important contribution to the state of knowledge of the Bay-Delta Watershed? For restoration proposals, is the project likely to contribute to ecosystem restoration or species recoveries in a significant way? Will the project produce products useful to decision-makers and scientists?

Products are relatively routine: (1) maps/images of indicators; (2) reports and papers; and (3) seminars and lectures.

4. **Cost/Benefit Comments.** Is the budget reasonable and adequate for the work proposed?

The full three-year funding level of \$919,439 is quite excessive considering the exploratory aspect of this project.

5. **Regional Review.** How did the regional panel(s) rank the proposal (High, Medium, Low)? Did the regional panel(s) identify significant benefits (regional priorities, linkages with other activities, local involvement) or impediments (local constraints, conflicts with other activities, lack of local involvement) to this proposal? What were they?

The Bay Regional Review ranked this proposal MEDIUM, with concern about lack of involvement of watershed groups or local outreach. The Delta Regional Review also rated it MEDIUM because of questions about the time-usefulness of the data, direct applicability to any restoration project, and whether such a project would require regular financial input to continue to be of value.

6. **Administrative Review.** Were there significant concerns about the proposal with regard to the prior performance, environmental compliance and budget administrative reviews? What were they?

The Environmental Compliance Review noted only the need for a Scientific Collecting Permit if native plants will be collected. There was no significant Budget Review concern.

Miscellaneous comments:

None

## Bay Regional Review:

**Proposal Number:** 216

**Applicant Organization:** University of California, Davis, Department of Land, Air, and Water Resources

**Proposal Title:** Environmental and ecological assessment of the habitats in San Pablo Bay and Sacramento-San Joaquin Delta region using remote sensing techniques

Overall Ranking:    -Low    **XMedium**    -High

Provide a brief summary explanation of the committee's ranking:

**the regional panel supports research that delivers scientific information which improves understanding about key ecosystem processes in the Bay and Suisun Marsh that are insufficiently understood. General maps, such as this would produce, are not needed**

1. Is the project feasible based on local constraints?

**X**Yes -No

How?

**- proposal technically feasible, includes analysis of need for survey protocols required by agencies**

2. Does the project pursue the restoration priorities applicable to the region as outlined in the PSP?

**X**Yes -No

How?

**- fulfills ERP goals 1,2,4,6 - fulfills Bay region goals 4 (understand wetland restoration performance)and 7 (Improve scientific understanding of links between at-risk species populations + inflows)**

3. Is the project adequately linked with other restoration activities in the region, such as ongoing implementation projects and regional planning efforts?

**X**Yes -No

How?

**yes and no**

**- UC Davis and SF State are the local research team and they are linked to other research efforts, but no watershed groups are mentioned or RCDs**

4. Does the project adequately involve local people and institutions?

-Yes XNo

How?

**- local outreach not a part of research design - research team will distribute information by a website, workshops, seminars, lectures to the interested public, planners, policy decision-makers, again no watershed groups involved**

Other Comments:

**none**

## Delta Regional Review:

**Proposal Number:** 216

**Proposal Title:** Environmental and ecological assessment of the habitats in San Pablo Bay and Sacramento-San Joaquin Delta region using remote sensing techniques

Overall Ranking:   -Low   **XMedium**   -High

Provide a brief summary explanation of the committee's ranking:

**The Committee felt that this information could be very valuable in evaluating ecosystem health generally. There was a question of the time-usefulness of the data that would be collected, and whether such a project would require regular financial input to continue to be of value.**

1. Is the project feasible based on local constraints?

**X**Yes -No

How?

**This project involves remote sensing and GIS applications, using software at the AGIS Lab at UC Davis. No CEQA or NEPA compliance required.**

2. Does the project pursue the restoration priorities applicable to the region as outlined in the PSP?

**X**Yes -No

How?

**MR-5, relating to environmental water quality (sediments). MR-6, relating to conceptual understanding/models that cross multiple regions (Bay and Delta).**

3. Is the project adequately linked with other restoration activities in the region, such as ongoing implementation projects and regional planning efforts?

**X**Yes -No

How?

**Proposal does not expressly address any restoration project tie-in directly, but would assess ecological conditions generally.**

4. Does the project adequately involve local people and institutions?

**X**Yes -No

How?



**Proposal includes the following outreach and information dissemination activities:  
maps/images of envtl/ecol indicators; publishing of studies in journals;  
workshops/seminars/lectures, and dissemination of information over a website.**

Other Comments:

**none**

# External Scientific: #1

## Research and Restoration External Scientific Review Form

Proposal Number: **216**

Applicant Organization: **University of California, Davis, Department of Land, Air, and Water Resources**

Proposal Title: **Environmental and ecological assessment of the habitats in San Pablo Bay and Sacramento-San Joaquin Delta region using remote sensing techniques**

### Conflict of Interest Statements:

I have no financial interest in this proposal.

**X**Correct

-Incorrect

In the blank below please explain any connection to proposal, to applicant, co-applicant or subcontractor or to submitting institution (write "none" if no connection):

**None**

### Review:

**Please provide an overall evaluation summary rating:**

**Excellent: outstanding in all respects;**

**Good: quality but some deficiencies;**

**Poor: serious deficiencies.**

Overall Evaluation Summary Rating	Provide a brief explanation of your summary rating
-Excellent	<b>Success is highly dependent upon amount of new data acquisition that can involve coincident remote sensing and groundtruthing.</b>
<b>X</b> Good	
-Poor	

1. **Goals.** Are the goals, objectives and hypotheses clearly stated and internally consistent? Is the concept timely and important?

**Goals, objectives and hypotheses are simply stated. While internally consistent, they tend to be driven predominantly toward the use of remote sensing as a technology rather than addressing specific scientific issues. The stated objective, in fact, is to use remote sensing techniques to assess the environmental and ecological conditions of the habitats in the Bay-Delta region. The listed hypotheses are actually objectives, as they actually define typical measurements and correlations among remote sensing image spectral signatures and environmental (typically surface) descriptors. Hypotheses based on the construct can be developed are much more methodological than scientific issues. In actuality, the actual hypotheses imbedded in the proposed study may be that biomass quantity, net primary**

productivity, vegetation cover percentage, surface moisture, near-surface heat fluxes, water turbidity and sediment content, and water chlorophyll content are general conditions of the habitat condition for many wildlife species rather than a blanket assumption. That these parameters indicate the health of the ecosystem is eminently challengeable and is more the proper hypothesis that might provide critical information to CALFED.

2. **Justification.** Is the study justified relative to existing knowledge? Is a conceptual model clearly stated in the proposal and does it explain the underlying basis for the proposed work? Is the selection of research, pilot or demonstration project, or a full-scale implementation project justified?

Some formative assumptions frame the intent and approach of the proposal, such as the importance of detecting variation in vegetation biomass and cover, but without explanation about how that will benefit the CALFED science program and the Bay-Delta scientific community. However, whether the value and importance attributed to these data are somewhat tenuous, the data could be extremely valuable depending upon how well integrated this project is with other, more empirical and process-based studies in CALFED. A conceptual model of the remote-sensing analysis methodology is included to define the flow and interconnectivity among study tasks, but there really is no equivalent to the concept of the pre-determined indicators.

3. **Approach.** Is the approach well designed and appropriate for meeting the objectives of the project? Are results likely to add to the base of knowledge? Is the project likely to generate novel information, methodology or approaches? Will the information ultimately be useful to decision-makers?

The stated approach is often vague enough to be confusing. For instance, the proposal appears to some degree to use existing remote sensing data (i.e., primarily Landsat TM and AVIRIS) of past environmental structure, yet the applicants imply that sampling and groundtruthing to establish the spectral signature ecosystem quality parameters will occur as a function after the fact. It is highly questionable that valid functional relationships between spectral signature and biomass quantity, net primary productivity, vegetation cover percentage, surface moisture, near-surface heat fluxes, water turbidity and sediment content, or water chlorophyll content would be considered by most remote sensing experts to be valid when displaced in time by weeks to months, much less years. Thus, the reviewer must assume that all quantitative relationships and models encompassing the range in environmental conditions will derive from completely coincident or closely acquired imagery and groundtruth sampling.

4. **Feasibility.** Is the approach fully documented and technically feasible? What is the likelihood of success? Is the scale of the project consistent with the objectives?

The technical approach is relatively well documented, although precise groundtruthing methods are poorly described or not included at all. There is no indication of accuracy or error assessment, something that every environmental remote sensing project must address. There is probably no question whether or not images/maps will be generated for each of the primary parameters indicating the environmental and ecological conditions of the region; the primary question would be whether or not these are interpretable simply as a descriptive characterization of parameter distribution. It might be questionable whether they would have much value unless coupled with other research projects within the image study area, especially those measuring fundamental processes rather than static state conditions.

5. **Project-Specific Performance Measures.** Does the project include appropriate performance measures to measure success relative to the project's goals and objectives? Is there enough detail as to how the performance measures will be quantified? For restoration projects, are monitoring plans

explicit and detailed enough to determine if performance measures will be adequately assessed?

**If the Project Management (section 4.2) lists are intended to provide performance measures, the proposal does include some (but oft strawperson) performance measures.**

6. **Products.** Are products of value likely from the project? Specifically for restoration projects, are products of value also likely from the monitoring component? Are interpretative outcomes likely from the project?

**The most important products from this project will be the proposed maps and images and, where feasible, coincident groundtruth and remote sensing measurements that will enable allow the algorithms and procedures to be applied to other imagery.**

7. **Capabilities.** What is the track record of applicants in terms of past projects? Is the project team qualified to efficiently and effectively implement the proposed project? Do they have available the infrastructure and other aspects of support necessary to accomplish the project?

**The personnel and institutional expertise appear to be highly qualified, with published results from similar analyses.**

8. **Cost/Benefit Comments.** Is the budget reasonable and adequate for the work proposed?

**The full three-year funding level (\$919,439) seems a bit risky for a pilot demonstration?**

**Miscellaneous comments:**

**The proposal represents either some considerable naïveté about environmental and ecological factors affecting or reflecting critical estuarine processes, or is vastly overselling the ability of the proposal to assess parameters that directly affect the fishery and other aquatic-dependent species in the region. It would be much more supportable if it were to be integrated with many of the other CALFED empirical and process-based studies that would provide more relevant groundtruthing at key CALFED research sites**

## External Scientific: #2

### Research and Restoration External Scientific Review Form

Proposal Number: **216**

Applicant Organization: **University of California, Davis, Department of Land, Air, and Water Resources**

Proposal Title: **Environmental and ecological assessment of the habitats in San Pablo Bay and Sacramento-San Joaquin Delta region using remote sensing techniques**

#### Conflict of Interest Statements:

I have no financial interest in this proposal.

**X**Correct

-Incorrect

In the blank below please explain any connection to proposal, to applicant, co-applicant or subcontractor or to submitting institution (write "none" if no connection):

**none**

#### Review:

**Please provide an overall evaluation summary rating:**

**Excellent: outstanding in all respects;**

**Good: quality but some deficiencies;**

**Poor: serious deficiencies.**

Overall Evaluation Summary Rating	Provide a brief explanation of your summary rating
-Excellent	<b>Aspects of this proposal are EXCELLENT, and remote sensing techniques can be very powerful tools for documenting change in landscape attributes. Change in vegetation cover and snap-shots of turbidity throughout the entire Delta are just two examples of some of the useful products that this research could generate. But the authors overstate the utility of the techniques in providing ecological assessment of habitats and do not make explicit connections to CALFED's Restoration plans. The present proposal is so expansive in its goals that it is hard to see what specific products emerge in support of the Restoration Program. There is TREMENDOUS POTENTIAL within this proposal, but in its present form the proposal is vague when describing ecological assessment and thus warrants only a GOOD rating.</b>
XGood	
-Poor	

1. **Goals.** Are the goals, objectives and hypotheses clearly stated and internally consistent? Is the concept timely and important?

The stated objective of the proposal is to conduct an environmental and ecological assessment of the habitats in the Bay-Delta region using remote sensing and GIS techniques. Remote sensing techniques allow landscape change and certain ecological functions to be quantified over large areas. In this regard, the proposed work is timely and important to the CALFED Bay Delta Restoration Program. The stated hypothesis "that different ecological conditions have different spectral characteristics...." is weak because this is already known and provides the basis for the application of remote sensing. However, successful application of remote sensing techniques require adequate ground truthing and the authors have outlined a strategy for acquiring Delta-specific ground information.

2. **Justification.** Is the study justified relative to existing knowledge? Is a conceptual model clearly stated in the proposal and does it explain the underlying basis for the proposed work? Is the selection of research, pilot or demonstration project, or a full-scale implementation project justified?

Assuming that previous Delta wide efforts to produce similar maps are absent or inadequate, then much of the proposed work is justified. The conceptual model associated with developing an accurate map of a specific attribute is clearly stated. The CALFED Restoration Program requires multiple methods for evaluating and quantifying landscape changes, and remote sensing techniques can be powerful tools in documenting such change. There are however limitations to these techniques. I think that maps that document changes in surface patterns of land cover are likely useful outcomes of the proposed work. These methods have limitations and I question the authors assertion that they will "assess the ecological conditions in the [various Delta] habitats and analyze their importance to the wildlife species in the region".

3. **Approach.** Is the approach well designed and appropriate for meeting the objectives of the project? Are results likely to add to the base of knowledge? Is the project likely to generate novel information, methodology or approaches? Will the information ultimately be useful to decision-makers?

I do not use remote sensing tools directly so I cannot critique the details of the authors methodology, but the approach seems reasonable. More importantly, the authors have extensive experience with this methodology. The authors propose to document a long list of physical and biological features such as biomass quantity, NPP, vegetation cover, surface moisture, near surface heat fluxes, water turbidity, sediment content, and chlorophyll. For some of these attributes snap-shots in time may be useful if documentation of change over a relevant time scale can be documented. The ultimate use of the information by decision makers is not explained in explicit terms, and is difficult to evaluate.

4. **Feasibility.** Is the approach fully documented and technically feasible? What is the likelihood of success? Is the scale of the project consistent with the objectives?

The authors have the expertise and experience to conduct the proposed work. The likelihood for the successful production of maps for some of the attributes above is extremely high. However, I do not see how the authors will be able to adequately assess ecological conditions in the habitats. The proposal would have been much easier to evaluate in terms of feasibility had the authors taken a specific attribute explain how change over time would be assessed and related to specific change in the ecology of the system.

5. **Project-Specific Performance Measures.** Does the project include appropriate performance measures to measure success relative to the project's goals and objectives? Is there enough detail as to how the performance measures will be quantified? For restoration projects, are monitoring plans explicit and detailed enough to determine if performance measures will be adequately assessed?

**these are not adequately explained in the proposal**

6. **Products.** Are products of value likely from the project? Specifically for restoration projects, are products of value also likely from the monitoring component? Are interpretative outcomes likely from the project?

**The authors have impressive publication records so useful products are almost certain. The authors also propose setting up a web site to share maps and images. Specific, detailed connections to restoration actions are absent.**

7. **Capabilities.** What is the track record of applicants in terms of past projects? Is the project team qualified to efficiently and effectively implement the proposed project? Do they have available the infrastructure and other aspects of support necessary to accomplish the project?

**excellent, highly qualified**

8. **Cost/Benefit Comments.** Is the budget reasonable and adequate for the work proposed?

**The budget seems very expensive considering that the proposal's major product to CALFED appears to be the generation of maps that would have to be updated frequently to evaluate change.**

**Miscellaneous comments:**

**The CALFED Bay Delta Restoration can certainly benefit from careful use of remote sensing techniques. What efforts are currently being supported by CALFED or accessible to CALFED? How can this research's group be best used in conjunction with the work of others? How can this work be explicitly connected to restoration actions?**

## Environmental Compliance:

**Proposal Number:** 216

**Applicant Organization:** University of California, Davis, Department of Land, Air, and Water Resources

**Proposal Title:** Environmental and ecological assessment of the habitats in San Pablo Bay and Sacramento-San Joaquin Delta region using remote sensing techniques

1. Are the legal or regulatory issues that affect the proposal identified adequately in the proposal?

☒Yes ☐No

If no, please explain:

**If native plant species will be collected, need to obtain a Scientific Collecting Permit. No other permits or CEQA/NEPA compliance necessary.**

2. Does the project's timeline and budget reflect adequate planning to address legal and regulatory issues that affect the proposal?

☒Yes ☐No

If no, please explain:

**N/A**

3. Do the legal and regulatory issues that affect the proposal significantly impair the project's feasibility?

☐Yes ☒No

If yes, please explain:

Other Comments:



## **Budget:**

**Proposal Number:** 216

**Applicant Organization:** University of California, Davis, Department of Land, Air, and Water Resources

**Proposal Title:** Environmental and ecological assessment of the habitats in San Pablo Bay and Sacramento-San Joaquin Delta region using remote sensing techniques

1. Does the proposal include a detailed budget for each year of requested support?

☒Yes ☐No

If no, please explain:

2. Does the proposal include a detailed budget for each task identified?

☒Yes ☐No

If no, please explain:

3. Does the proposal clearly state the type of expenses encompassed in indirect rates or overhead costs?

☒Yes ☐No

If no, please explain:

4. Are appropriate project management costs clearly identified?

☐Yes ☒No

If no, please explain:

**Project Manager not considered as to costs.**

5. Do the total funds requested (Form I, Question 17A) equal the combined total annual costs in the budget summary?

☐Yes ☒No

If no, please explain (for example, are costs to be reimbursed by cost share funds included in the budget summary).

**\$1.00 difference!**

6. Does the budget justification adequately explain major expenses?

☒Yes -No

If no, please explain:

7. Are there other budget issues that warrant consideration?

☒Yes -No

If yes, please explain:

**Proposed Amount used Federal overhead rate.**

Other Comments: